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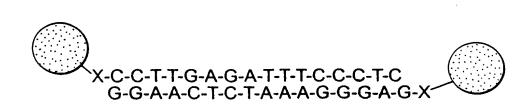
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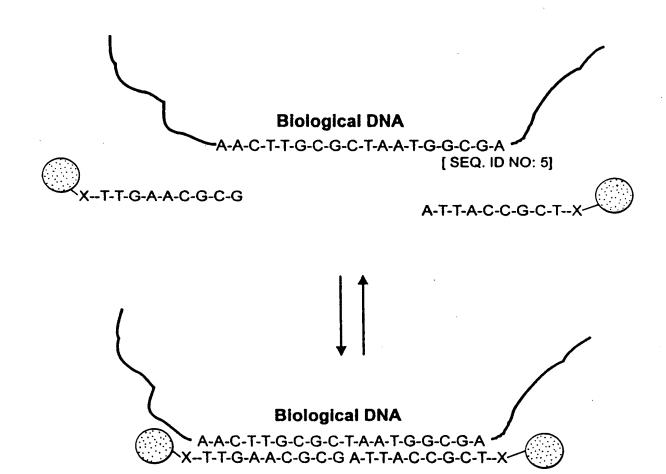


[SEQ. ID NO: 3] X-C-C-T-T-G-A-G-A-T-T-T-C-C-C-T-C 5'

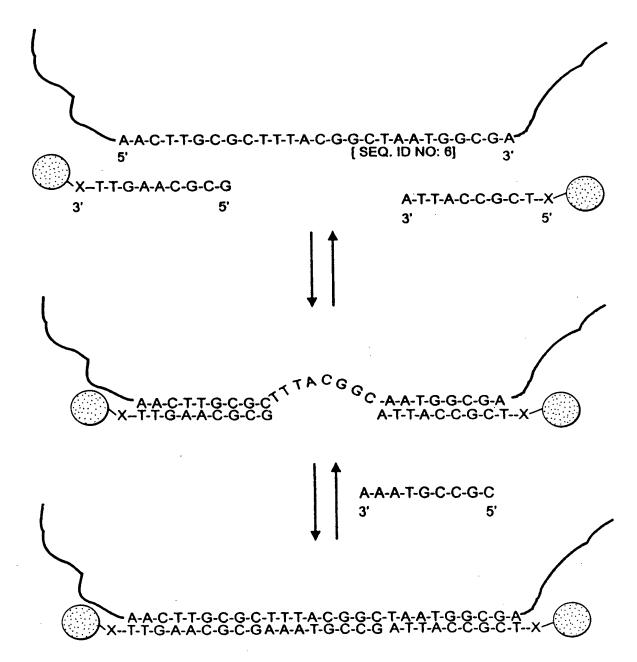
G-G-A-A-C-T-C-T-A-A-A-G-G-G-A-G-X
[SEQ. ID NO: 4]











Mix below Tm

Heat



Linking oligonucleotide FIG. 4 A-T-G-G-C-A-A-C-T-A-T-A-C-G-C-G-C-T-A-G A-T-A-T-G-C-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-A SEQ. ID NO. 21 3 3 [SEQ. ID NO: 2]

[SEQ. ID NO:1]

Colloids

Aggregate

3' 5' A-T-G-G-C-A-A-C-T-A-T-A-C-G-C-G-C-T-A-G A-G-T-C-G-T-T-T--> X-T-A-C-C-G-T-T-G A-T-A-T-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-A 3' 5'

Stand below Tm Heat

Precipitate (formed by further cross-linking)



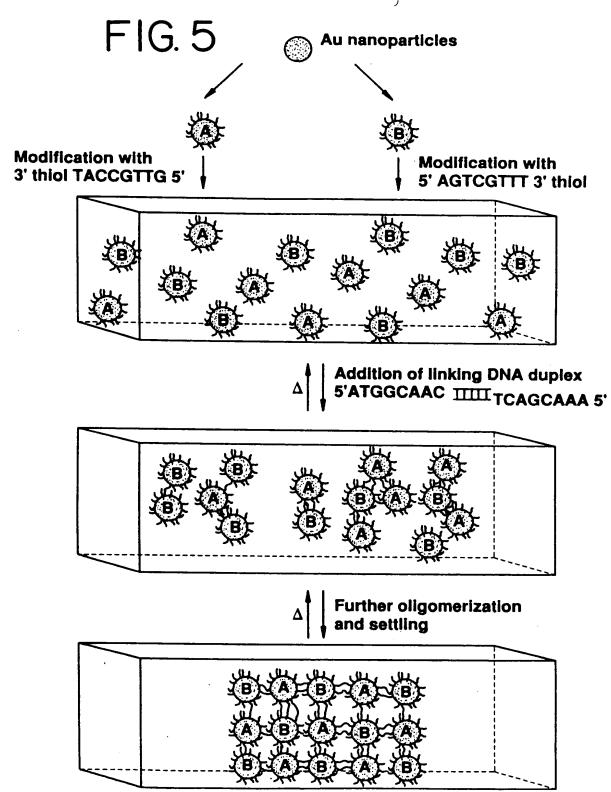
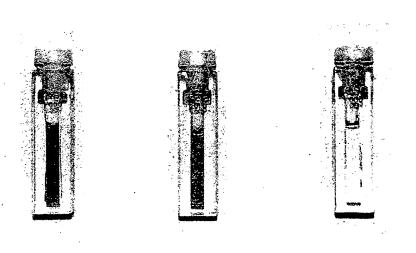
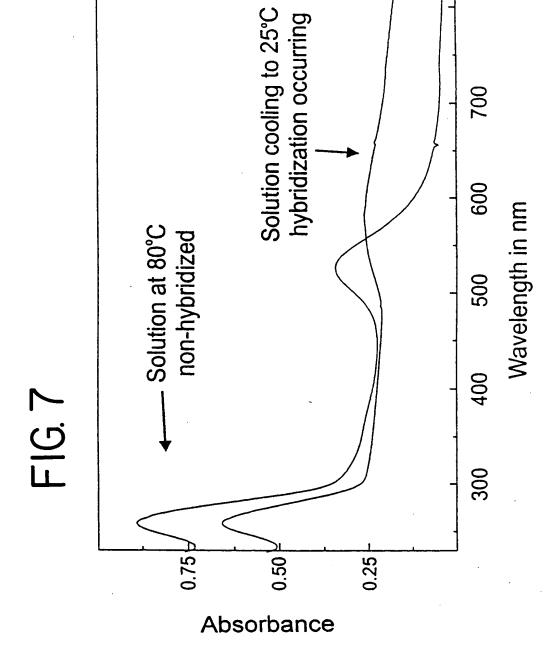




FIG. 6A FIG. 6B FIG. 6C









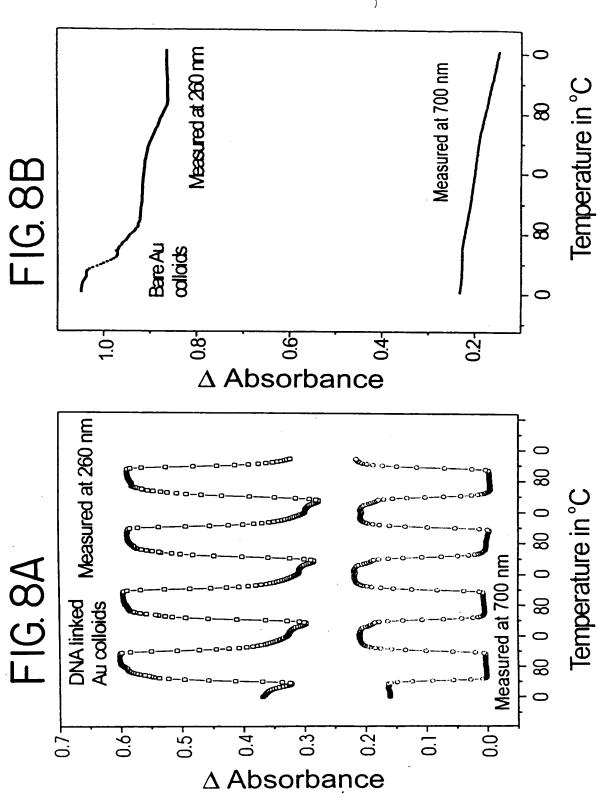




FIG. 9A

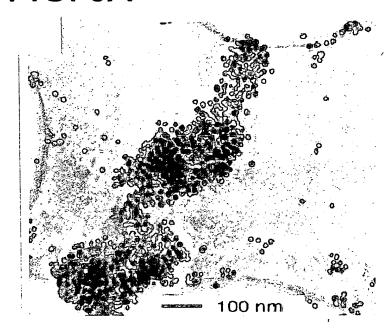
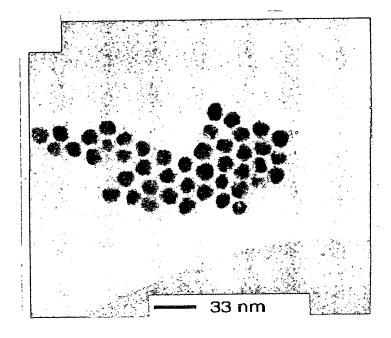


FIG. 9B



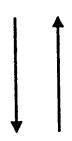


[SEQ ID NO: 7]

5'
3'
X--T-C-T-C-C-C-T-T-T-C
A-G-A-G-G-A-A-G-G-X
3'

[SEQ ID NO: 8]

3' T-C-T-C-C-T-T-C-C-C-T-T-T-T-C 5' [SEQ ID NO: 9]



5' 3' X--T-C-T-C-C-T-T-C-C-C-T-T-T-C A-G-A-G-G-A-A-G-G-A-A-A-A-G--X 3' T-C-T-C-C-T-T-C-C-C-T-T-T-T-C 5'



F16. I

's-A-T-G-G-C-A-A-C-T-A-C-G-C-G-C-T-A-G-A-G-T-C-G-T-T-T _[SEQ. ID NO: 10]

T-A-C-C-G-T-T-G-A-T-A-T-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-A-S-3'
3'
[SEQ. ID NO: 11]

T-A-C-C-G-T-T-G-A-T-A-T-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-A-S s-A-T-G-G-C-A-A-C-T-A-T-A-C-G-C-G-C-T-A-G-A-G-T-C-G-T-T-T



FIG. 12A 12/47 Complementary Target [SEQ. ID NO: 14] SEQ. ID NO:12] 5' A-G-C-A-T-G-G-T-C-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C SEQ. ID NO:13 FIG. 121 **Probes without Target** 3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G FIG. 12C Half Complementary Target 5' A-G-C-A-T-G-G-T-C-G-A-T-A-G-G-A|T-G-G-C|A|A-C-T-A-T-A|C-G-C [SEQ. ID NO: 15] FIG. 12D Target - 6 bp 5' G-T-C-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C [SEQ. ID NO: 16] FIG. 12E One bp Mismatch 3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G 5' A-G-C-A-T-G-G-T-T-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C [SEQ. ID NO: 17] FIG. 12F Two bp Mismatch 3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G 5' A-G-C-A-T-G{T-T-T-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C SEQ. ID NO: 18]





FIG. 13A

transparent substrate

Modified DNA chemisorbed onto solid substrate

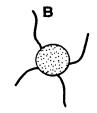
} A.

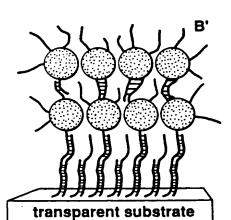
Analyte DNA

transparent substrate

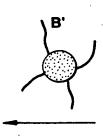
Analyte DNA hybridized onto substrate

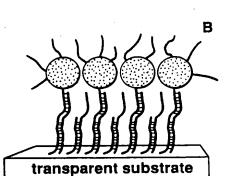
DNA modified colloids





Dark areas where nanoparticle aggregates are linked to substrate surface by analyte DNA





DNA modified colloids hybridized to bound analyte DNA

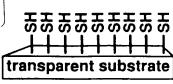


FIG. 13B

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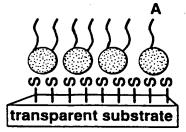
transparent substrate

thioi terminated modification of surface



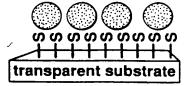
gold nanoparticles

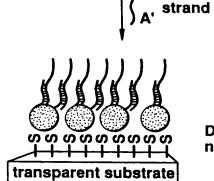




thiol modified **DNA** adsorbed onto particles

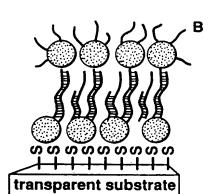
analyte DNA





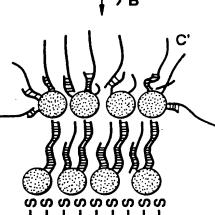
DNA modified nanoparticles

DNA modified



analyte DNA hybridized to **DNA** modified nanoparticles





transparent substrate

transparent substrate

nanoparticles nanoparticle aggregates linked to substrate by analyte DNA

dark areas where





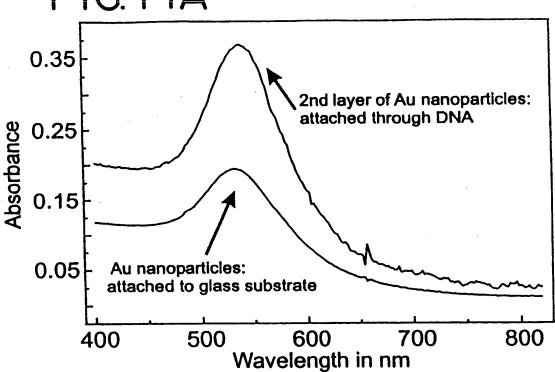
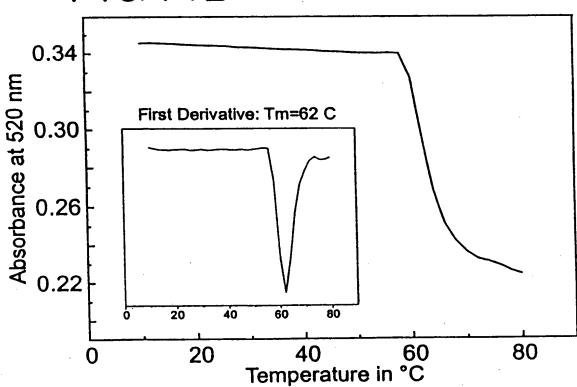


FIG. 14B



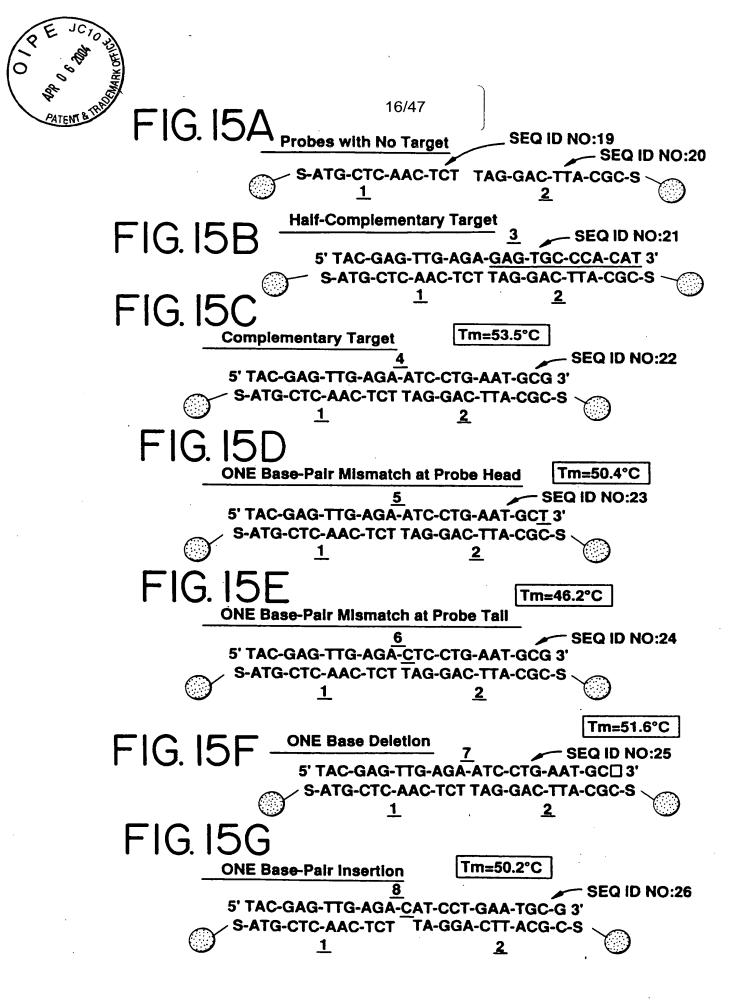




FIG. 16A

24 Base Template

FIG. 16B

48 Base Template with Complementary 24 Base Filler

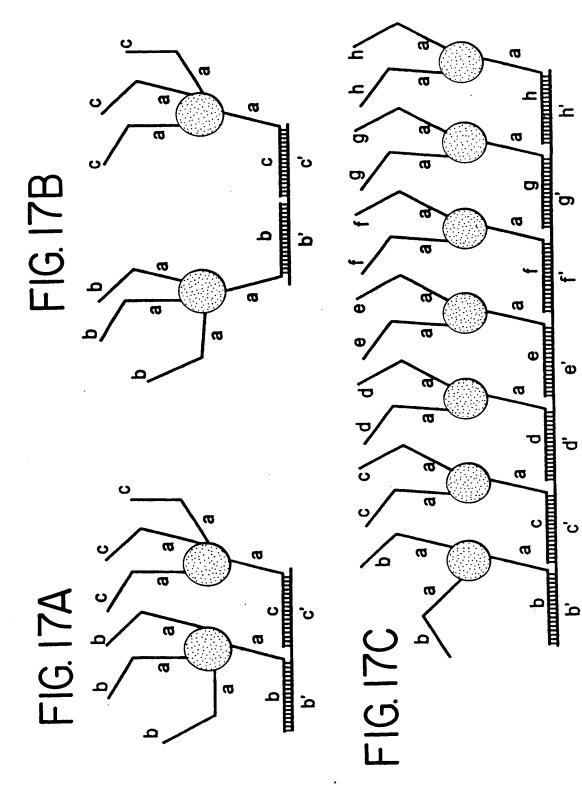
5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-ATC-CTG-AAT-GCG 3' > S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT TAG-GAC-TTA-CGC-S

F1G. 16C

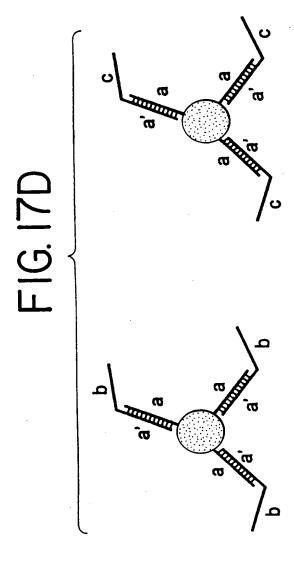
72 Base Template with Complementary 48 Base Filler

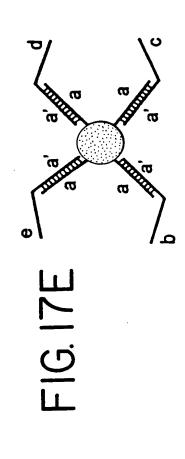
S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT-ATA-TAA-CCT-GCG-AAA-TGC-CTG-TTG TAG-GAC-TTA-CGC-S ~ 5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-TAT-ATT-GGA-CGC-TTT-ACG-GAC-AAC-ATC-CTG-AAT-GCG 3'



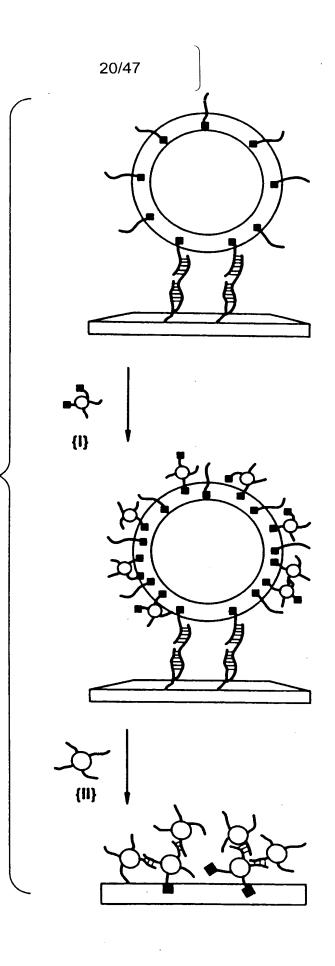














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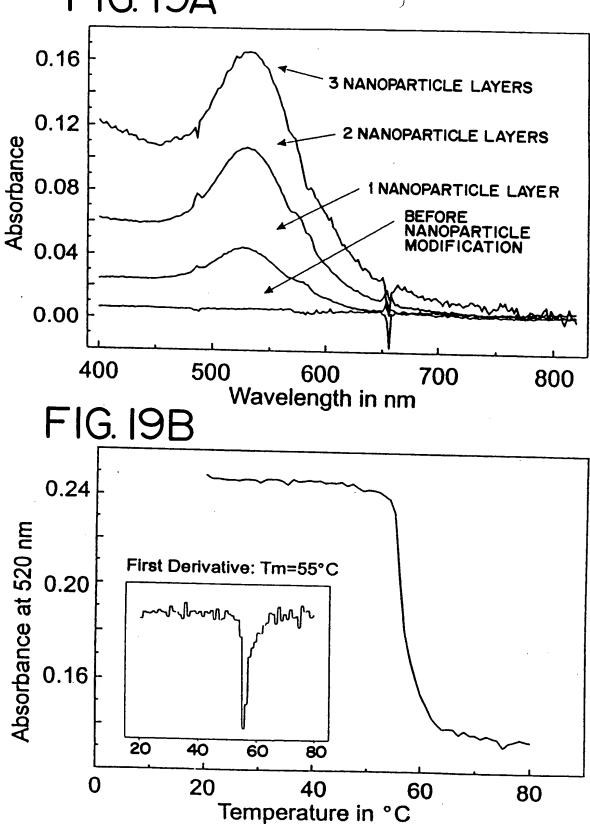
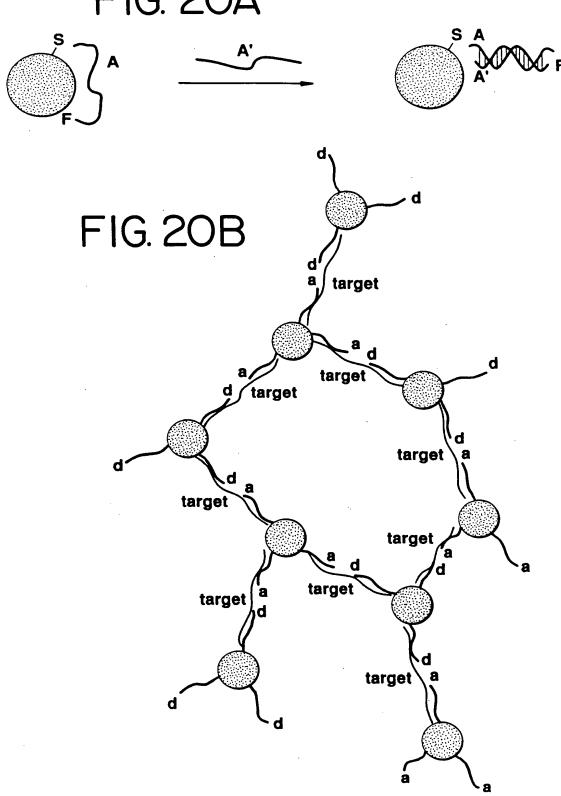




FIG. 20A



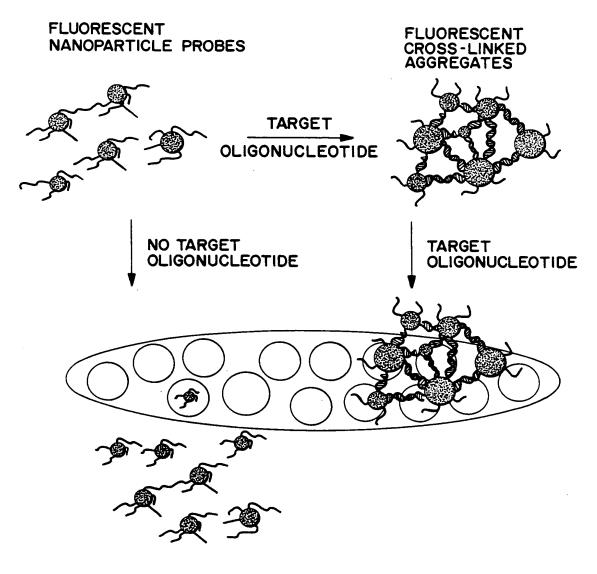
pass through

membrane



Pink/Non-fluorescent Excess Au probes Au/Latex hybrid Target Oligonucleotide 0000 Oligonucleotide Target oligonucleotide modified Fluorophore labeled White/Fluorescent Oligonucleotide 00 latex probes No Target nanoparticle probes 0000 All Au probes pass through membrane Oligonucleotide modified Au Red F16.21





THE FLUORESCENT NANOPARTICLE PROBES PASS THROUGH THE MEMBRANE

THE FLUORESCENT CROSS-LINKED AGGREGATES ARE RETAINED BY THE MEMBRANE



Anthrax PCR Product

5'G GCG GAT GAG TCA GTA GTT AAG GAG GCT CAT AGA GAA GTA ATT AAT 3'C CGC CTA CTC AGT CAT CAA TTC CTC CGA GTA TCT CTT CAT TAA TTA

TCG TCA ACA GAG GGA TTA TTG TTA AAT ATT GAT AAG GAT ATA AGA AAA AGC AGT TGT CTC CCT AAT AAC AAT TTA TAA CTA TTC CTA TAT TCT TTT

ATA TTA TCC AGG GTT ATA TTG TAG AAA TTG AAG ATA CTG AAG GGC TT 3'
TAT AAT AGG TCC CAA TAT AAC ATC TTT AAC TTC TAT GAC TTC CCG AA 5'

141 mer Anthrax PCR product [SEQ ID NO:36]

3' CTC CCT AAT AAC AAT

3' TTA TAA CTA TTC CTA -

[SEQ ID NO:38] ·

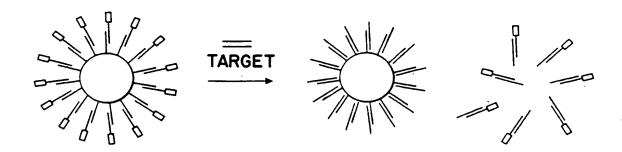
Oligonucleotide-Nanoparticle Probes

Blocker Oligonucleotides

3' C CGC CTA CTC AGT CAT CAA TTC CTC CGA GT	[SEQ ID NO:39]
3' A TCT CTT CAT TAA TTA AGC AGT TGT	[SEQ ID NO:40]
3' TAT TCT TTT TAT AAT AGG TCC CAA TAT	[SEQ ID NO:41]
3' AAC ATC TTT AAC TTC TAT GAC TTC CCG AA	[SEQ ID NO:42]

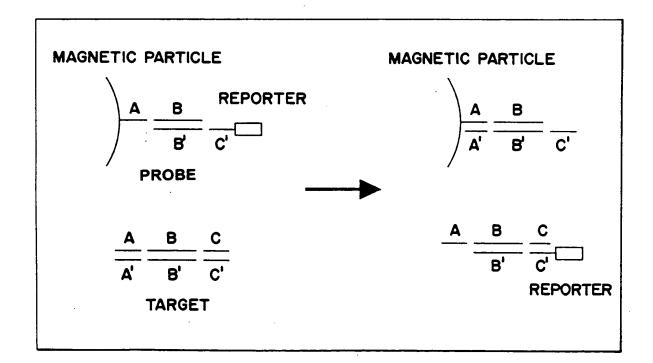






SATELLITE PROBE

DETECTION SIGNAL



.



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FIG. 25A

1. \sim (TARGET)





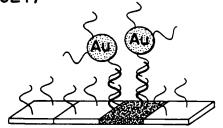
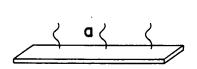
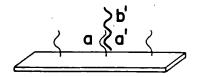
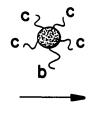


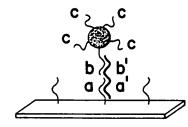
FIG. 25B

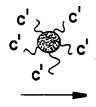


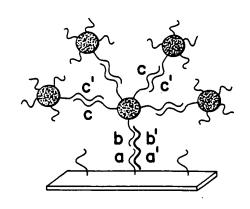












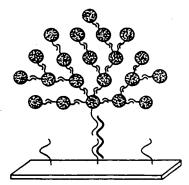




FIG. 26A

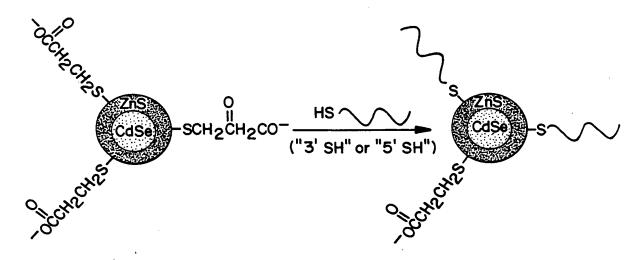
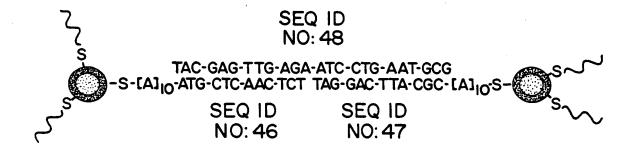


FIG. 26B





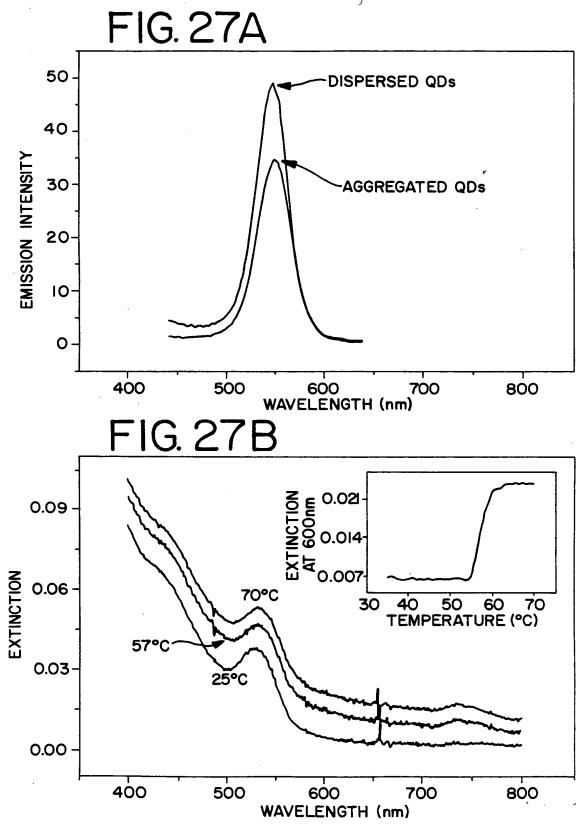




FIG. 27C

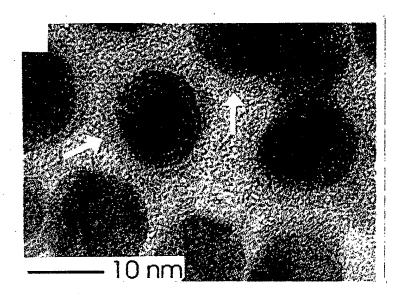


FIG. 27D

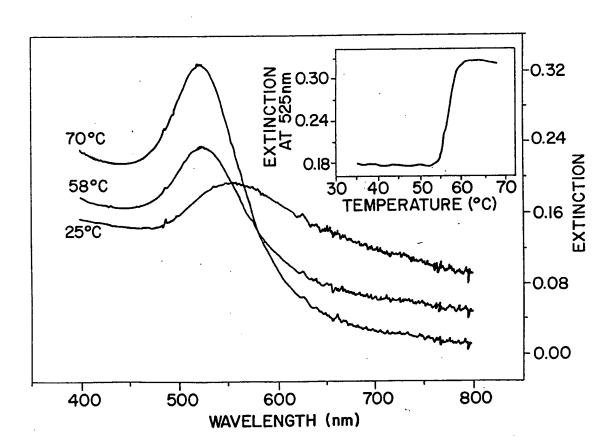




FIG. 28A





FIG. 28B

FIG. 28C

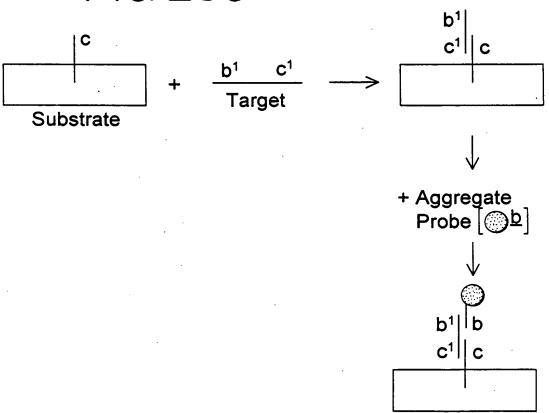




FIG. 28D

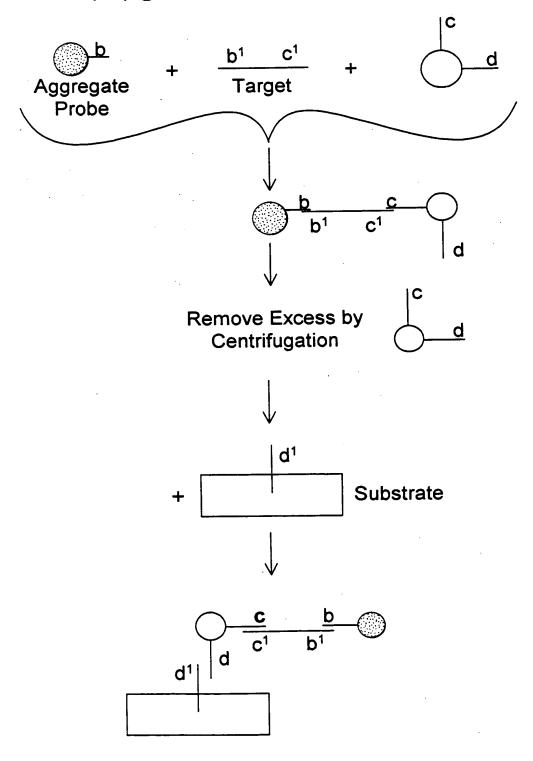
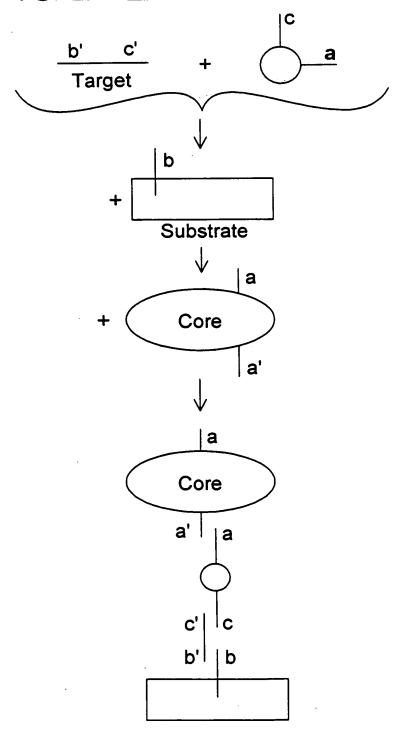
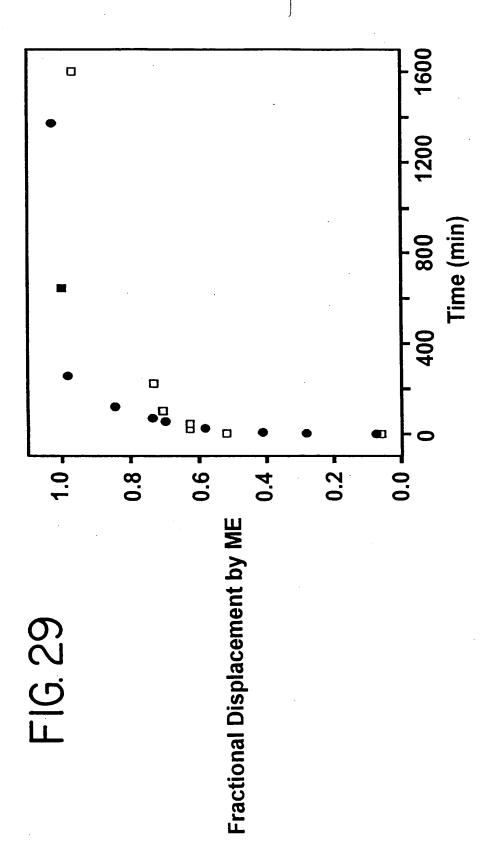


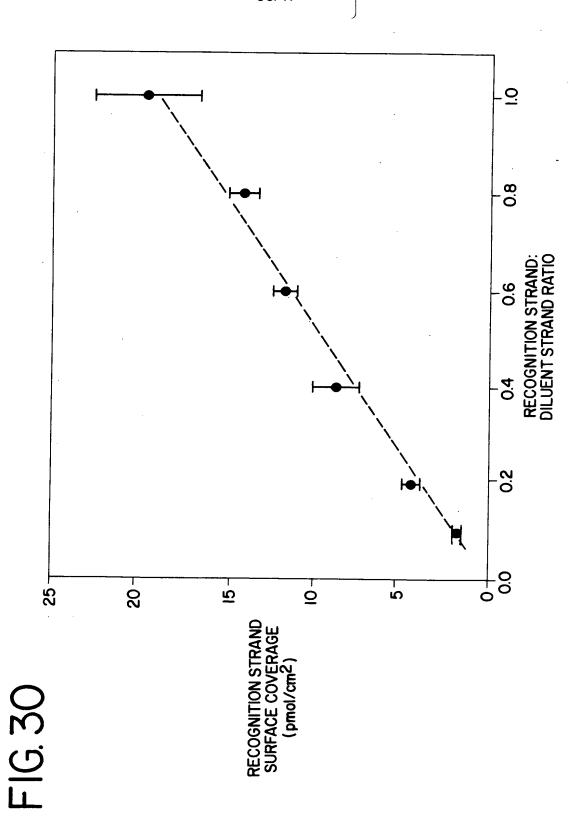


FIG. 28E











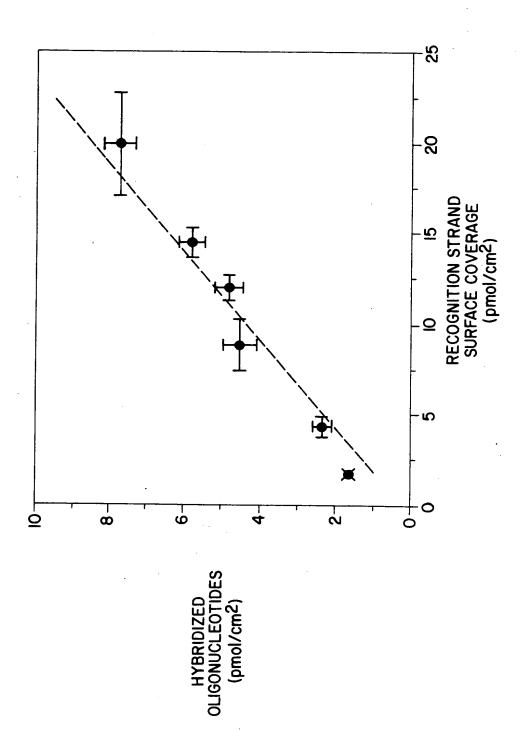




FIG. 32

[SEQIDNO:56]

5' GGA T**T**A TTG TTA- -AAT ATT GAT AAG GAT 3' CCT A**N**T AAC AAT TTA TAA CTA TTC CTA \(\simeq \)

[SEQ ID NO: 57]

[SEQ ID NO: 58]

N = A (complementary), G,C,T (mismatched)

1. \square (target DNA)

2.



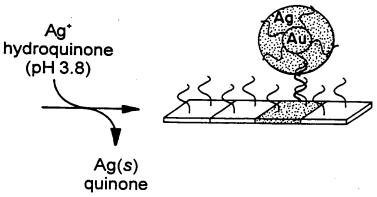
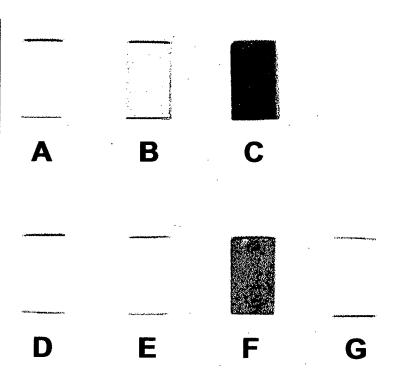
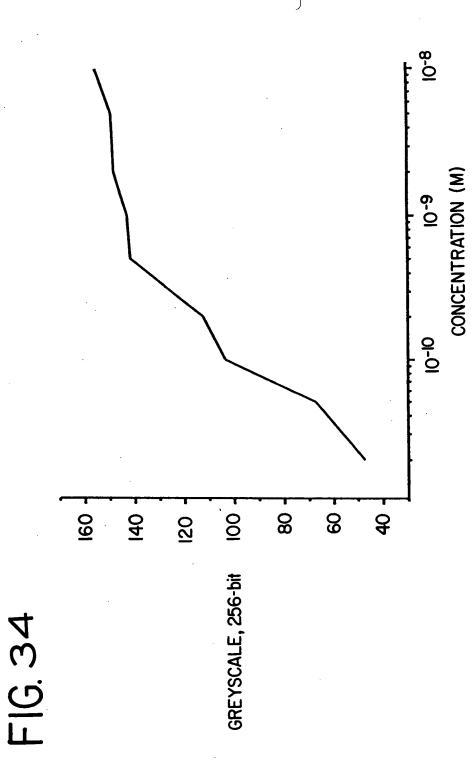




FIG. 33

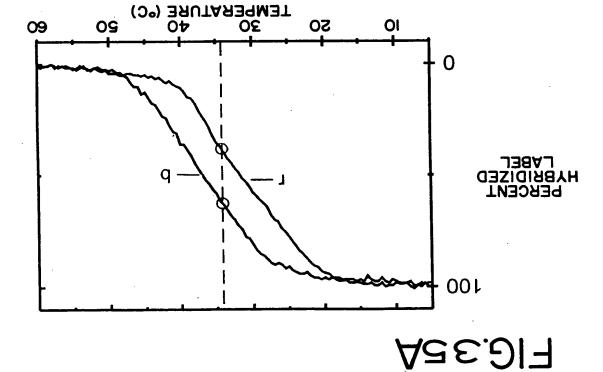












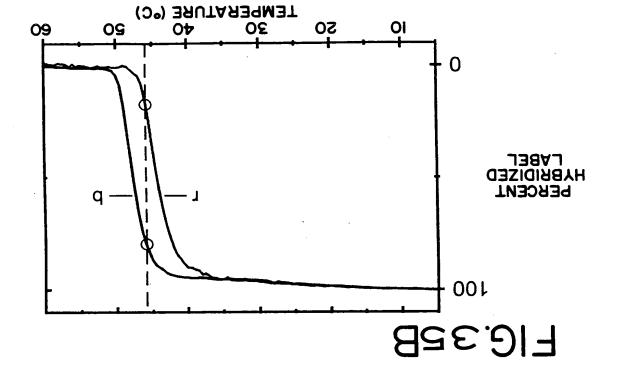




FIG. 36A

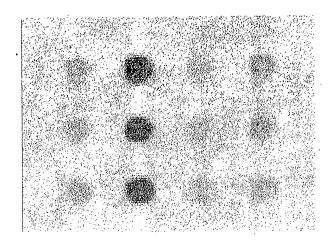
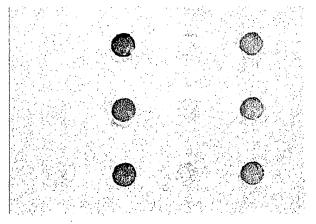


FIG. 36B



CATG



FIG.37A

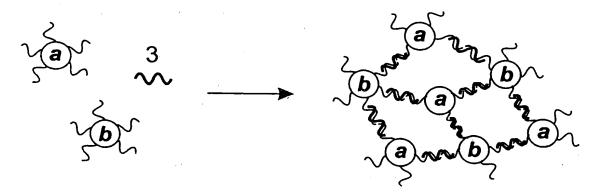
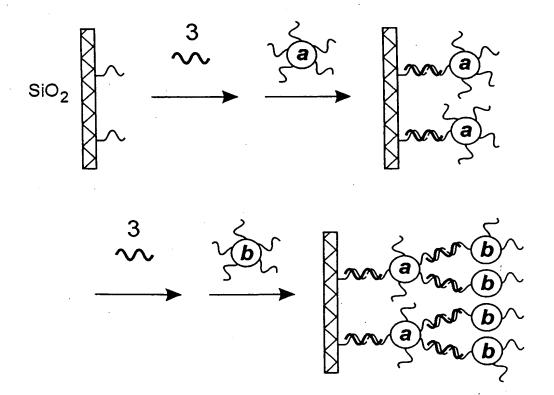
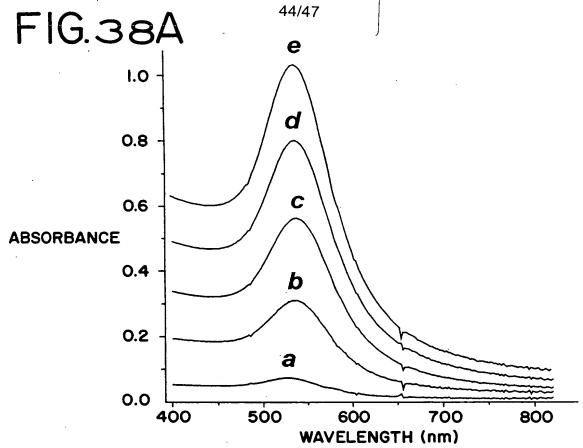


FIG.37B







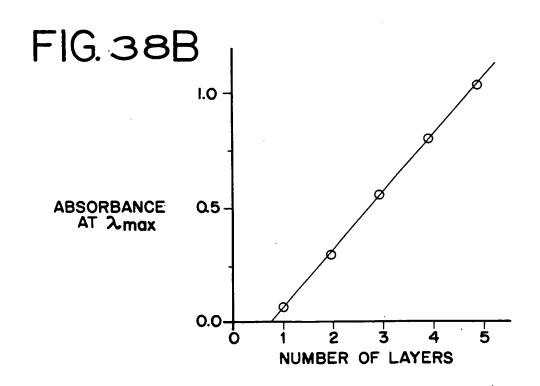




FIG. 39A

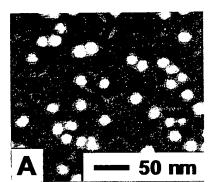
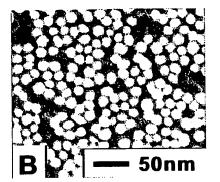
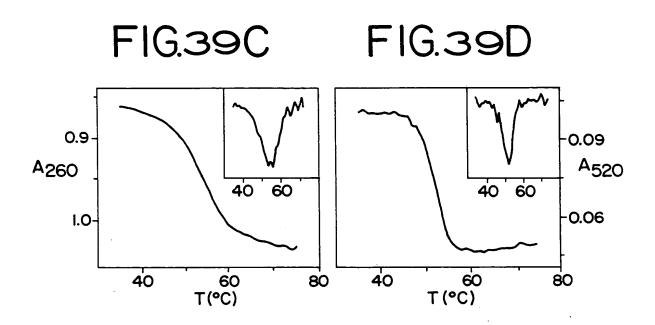
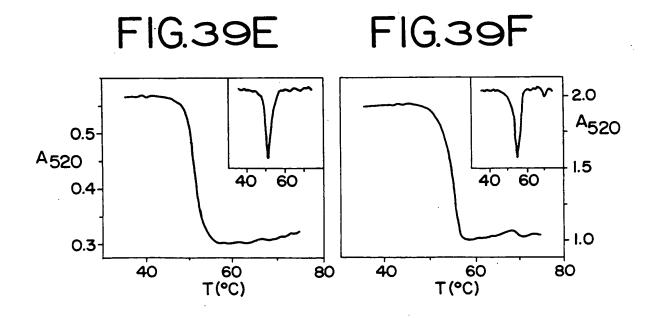


FIG. 39B











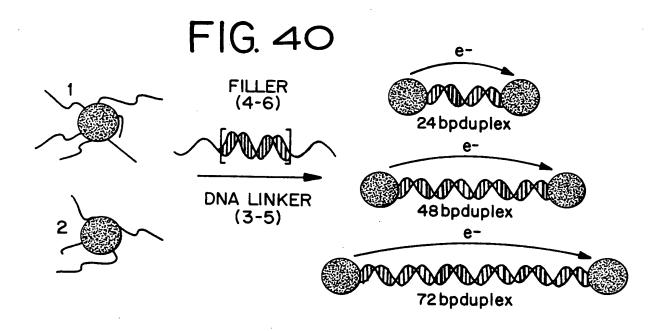


FIG. 41

